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Novel diluted magnetic semiconductors based on $\text{Sb}_{2-x}\text{V}_x\text{Te}_3$

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We report on a novel diluted magnetic semiconductor based on the Sb_2Te_3 tetradymite structure doped with very low concentrations of vanadium (1 - 3 at%). A transition to a ferromagnetic state manifests itself through a rapidly rising magnetic susceptibility below 30 K and robust hysteresis loops observed at liquid helium temperatures when the magnetic field is oriented parallel to the c-axis of the crystals. Furthermore, the onset of ferromagnetism leads to the anomalous Hall effect and a marked reduction in the spin disorder scattering. The maximum Curie temperature for the range of vanadium concentrations covered in this experiment is 24 K. This discovery broadens the field of diluted magnetic semiconductors and offers exciting possibilities for exploring magnetic properties of other tetradymite structure semiconductors doped with a wide range of 3d transition metals.